

EXAMINER'S REMARKS

The drawings were objected to under 37 CFR 1.83(a), for not showing every feature of the invention specified in the claims. Claim 6 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which is not sufficiently described in the specification. Claims 1,2 and 4-6 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S.P.N. 4,551,743 to Murakami in view of U.S.P.N. 4,502,0913 to Lechaton et al.

SUMMARY OF APPLICANTS' INVENTION

The present invention is a semiconductor isolation structure separating two active devices in their application. The isolation structure prevents undesired electrical connections and coupling between two devices. The isolation structure has a deep region and a shallow region. The deep region has a wider cross-sectional area than the shallow region. The deep region includes an oxide, and the shallow region has a protective wall that can be formed from an oxide and a nitride.

37 CFR 1.83(a)

The drawings were objected to under 37 CFR 1.83(a), for not showing every feature of the invention specified in the claims. Claim 5 recites a trench isolation structure having a protective outer wall adjacent to the substrate, with an inner sealing wall located exclusively within the shallow region and adjacent to the protective outer wall. Claim 6 further recited that the protective outer wall comprised an oxide wall and a nitride wall, a feature not found in any of the drawings.

On page 7, line 5 of the present application, the first wall has a reference number 320 (Figure 3). On page 7, line 11, this first wall consists of nitride. On page 7, lines 5 and 6, the second wall has a reference number of 330 (Figure 3). On page 7, line 12, the second wall consists of oxide.

Claim 6 has been amended, and now recites that the “protective outer wall comprises an oxide” and the “inner sealing wall comprises a nitride”. The objection under 37 CFR 1.83(a) is believed to be overcome.

35 U.S.C. §112, first paragraph – claim 6

Claim 6 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which is most nearly connected, to make and/or use the invention.

Claim 5 recites a protective outer wall adjacent to the substrate, and an inner sealing wall located exclusively within the shallow region and adjacent to the protective outer wall. Claim 6 further limits the protective outer wall of Claim 5. On page 7, line 5, the first wall has a reference number 320 (Figure 3). On page 7, line 11, this first wall consists of nitride. On page 7, lines 5 and 6, the second wall has a reference number of 330 (Figure 3). On page 7, line 12, the second wall consists of oxide.

Claim 6 now recites that the “protective outer wall comprises an oxide” and the “inner sealing wall comprises a nitride”. The rejection under the first paragraph of 35 U.S.C. §112 is believed to be overcome.

35 U.S.C. § 103(a) – claims 1,2, and 4-6

Claims 1,2, and 4-6 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S.P.N. 4,551,743 to Murakami in view of U.S.P.N. 4,502,0913 to Lechaton et al.

Murakami teaches a semiconductor isolation structure with a single protective wall, used to isolate active regions in the semiconductor. Murakami found that prior art isolation structures had walls that were too thick. In column 1, lines 27-35, Murakami states that a double wall consisting of an oxide layer and nitride layer is too thick. If the wall of the isolation structure is too thick, the actual width of an active region differs greatly from the intended design width of the active region, and integration density is



reduced (column 1, lines 25-36). Accordingly, Murakami built an isolation structure with a thinner wall (column 3, lines 14-19).

Lechaton et al. teaches an isolation structure with a protective double wall (see Figure 2) consisting of oxide (24) and nitride (26) (column 4, lines 49-61).

Murakami specifically teaches away from using a double walled isolation structure as taught by Lechaton et al. In Murakami column 1, lines 27-35, Murakami states that a double wall consisting of an oxide layer and nitride layer is too thick, and reduces the integration density. Therefore, Murakami teaches away from being combined with Lechaton et al. The rejection under 35 U.S.C. § 103(a) is believed to be overcome.

CONCLUSION

If the Examiner has any further questions or would like to discuss this application in more detail, he is invited to call the applicants' agent at the telephone number given below. The applicants respectfully suggest that the claims presently in the application are distinct over the prior art and that the application is now in condition for allowance. Accordingly, the applicants solicit favorable action.

Respectfully submitted,
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